# Lead-Laden Freeway Parks Hazardous to Kids

*by Louis Freedberg*

From his small street front office in the Pilsen neighborhood of Chicago, Guillermo Gomez looks across the street to busy Interstate 94 leading to downtown Chicago. Under the freeway is a fallen monument to a city planner's dream! Sawed-off metal stumps of playground equipment, unused benches, pieces of concrete and tarmac scattered randomly about, and a rusted basketball hoop are all that is left of the neighborhood's freeway park.

It seemed like a great idea when the park was first installed. The space under the freeway was unused and it was cheap — in a neighborhood that desperately needed more recreation facilities for its children. The Pilsen neighborhood is a mixed residential-industrial area only ten minutes from downtown Chicago, with a primarily Latino population. Gomez is the organizer for the local community organization, the Pilsen Housing and Business Alliance. His main priority is to bring more jobs into the community, and to revitalize some of the abandoned factories that dominate the local landscape.

"One day a tire flew off the freeway into the living room of the people across the street," Gomez recalls. "The kids also didn't like it too much because of the fumes." So his organization voted to ask the city to remove the freeway park. Before he could contact city officials, maintenance crews came down on their own — apparently under instructions from the state bureaucracy concerned about falling concrete from the freeway. In a matter of hours, the park was dismantled. Now all that is left is a cold, sunless space, dominated by the echoing noise of cars and trucks passing overhead.

What Gomez and others in the neighborhood did not know is that parks and playgrounds under or near freeways contain a less visible but more pervasive hazard than flying truck tires: lead in the soil and in the air.

### Few Communities Realize Danger

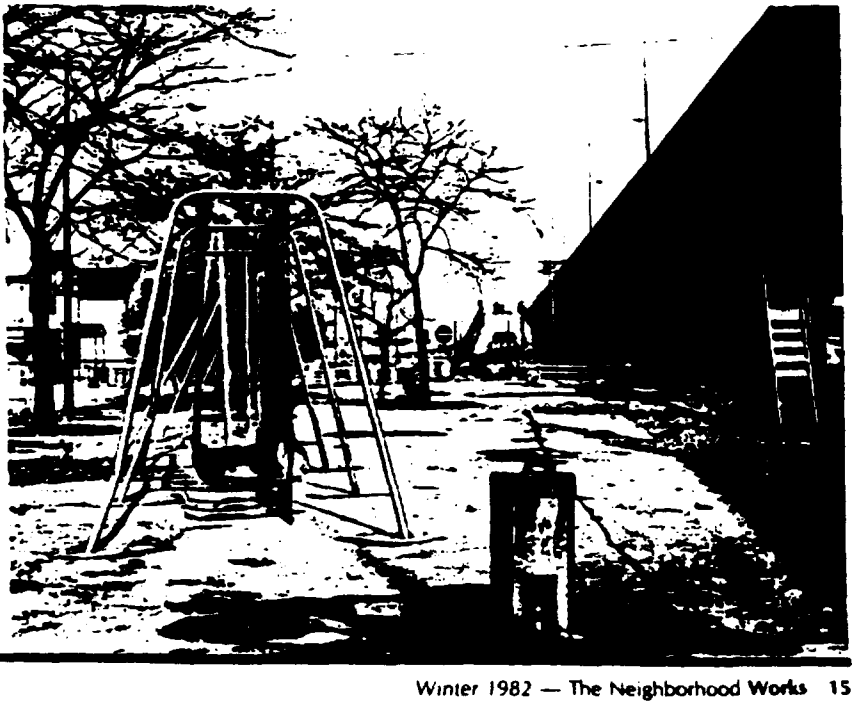
They also did not know about a study conducted just a few miles away, in the nearby town of Morton Grove. Much of the traffic in and out of Chicago passes through this bedroom community, better known as the catalyst for hand gun control across the country than for its efforts to control exhaust fumes from freeway traffic which sometimes reach 100,000 cars per day. Five years ago, the Morton Grove Board of Trustees commissioned the Illinois Institute for Environmental Quality to look at the possible impact of lead deposits in air and soil near freeways on children — the only community before or since to commission such a study.

Researchers found extremely high lead levels in the air and soil near freeways running through the town. They also found elevated blood levels in children living near the freeway. The study concluded that "airborne lead from automobiles using heavily traveled roadways may contribute to the blood lead levels of children, especially to that of pre-school children." Among the report's recommendations: putting up baffles, such as trees, to deflect some of the lead, and, more ominously, educating parents "so that they understand the importance of keeping non-food items out of their children's mouths and for frequent and thorough handwashing."

In Oakland, California, the interchange in the Grove-Shafter freeway is an impressive piece of engineering, with its matrix of clover leaf on- and off-ramps. The freeway was designed to revitalize a decaying downtown, and has partially succeeded in doing that. Like many cities across the country, the city decided to build a series of parks and playgrounds under or near the freeway. In one of the parks, children from a neighboring elementary school came over to pay regularly during recess.

By chance, the county had received federal funding to begin a Lead Prevention Project. Part of its job was to identify sources of lead poisoning in children. Testing was done in the Grove-Shafter parks. What health officials found surprised them. In the soil and on the picnic tables were levels of lead as high as 9,500 parts per million (ppm) — over nine times the "safe" level of 1000 ppm.

As a result of its findings, the picnic tables in the parks were removed. Children from the elementary school were advised not to play there during their breaks. "They put in a little walkway and a few receptacles," says Gordon Coleman, the health officer in charge of



Albert Belmonte

the testing. "It's the kind of place where you can sit and read." Health officials put out the clear message that the freeway parks were no place for small children, or for eating.

In spite of the Oakland and Morton Grove findings, public officials in urban areas across the country express little or no concern about the possible presence of lead in freeway parks. There has been virtually no systematic testing of soils in outdoor areas where children play.

### New York Report Never Released

An exception is in New York City, where six years ago Dr. Anita Curren, then with the city health department, did a study of lead levels in city parks. What she came up with closely matched the Oakland results.

"We found when playgrounds were near a major thoroughfare there were higher lead levels," Curren says. Several parks had lead levels higher than 1000 ppm. What concerned Curren especially was the possibility of small children with sticky or wet hands picking up soil, and then putting their hands in their mouths. In a "worst case" scenario, Curren and her researchers dipped a lollipop in sandlots, and concluded that a child licking the lollipop would ingest 90 milligrams of lead, an amount much higher than the established "safe levels."

Remarkably, Curren's report was never released. The results were never written up. She moved to another job in Westchester County.

New York City now has no official policy regarding construction of playgrounds near or under freeways. Although the park official in charge of construction admitted that freeway parks are "generally a vile place to be," he expressed no concern about the possibility of lead deposits.

In Los Angeles, where park officials have been forced into a somewhat higher level of environmental sensitivity, they acknowledge that there might be a problem in "one or two" parks in East Los Angeles where high lead levels were found. Yet no precautions have been taken to keep children out of these parks, nor to warn parents of possible dangers.

The furthest Los Angeles has come — which is further than most other cities — is to adopt a policy barring construction of more facilities in freeway parks, and also not to encourage "active" sports and activities there.

A reason for this modest first step may lie in a study conducted several years ago in Los Angeles which showed that young people playing basketball in those dime-a-dozen courts under freeways have below-normal oxygen levels in their blood due to auto emissions.

### Experts Disagree on Freeway Lead

The dangers of lead near freeways has been so well documented in the scientific literature that the lack of awareness or concern among city planners and park officials is astounding. One of the reasons for the lack of concern may have to do with the general agreement among experts that the major cause of lead poisoning in children are lead-based paints. Since these were banned ten years ago, the incidence of actual lead poisoning among children has declined steadily. The use of unleaded gasoline has also lowered lead levels in children.

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Yet even with less use of lead-based paints and less lead in gasoline, large numbers of children in the U.S. still have blood lead levels higher than the existing — and probably inadequate — standard of 30 micrograms per decilitre established by the Center for Disease Control. The latest statistics, released in May, 1982 by the Department of Health and Human Services, show that one out of twenty, or a staggering 675,000 children between the ages of 6 months and 5 years have blood lead levels above the standard. The data for black children is even more chilling: 12 percent, or one in five, black children have elevated blood lead levels.

To establish the extent of lead hazards in playgrounds near freeways, three questions have to be answered. Is the amount of lead emitted by cars sufficient to pose a hazard to children? Is the amount of lead deposited in the soil near freeways sufficient to pose a hazard to children? Is the amount of lead deposited in the soil near freeways sufficient to enter the bloodstream of children? And once the lead has entered the blood stream, does it enter it in sufficient quantity to harm children?

The scientific literature provides a convincing affirmative answer to each of these questions.

### Research Suggests Danger to Kids

Hundreds of thousands of tons of lead are emitted into the atmosphere each year from various sources. Over 90 percent comes from cars. In California alone, 93 percent of the 13,500 tons of lead in the atmosphere comes from automobile emissions. In Los Angeles, 18 tons of lead a day are spewed from the exhausts of cars. Over half of the lead — 57 percent — is deposited on freeways or on the streets next to them.

After taking hundreds of soil samples throughout the state, the California Lead Prevention Project concluded that "there is no doubt that urban California soil is sufficiently contaminated with lead to pose a potential hazard to many children." One example: of 114 soil samples taken in elementary schools, 26 were found to have lead levels of over 1000 ppm. Researchers speculate the elevated lead levels may have come from lead being deposited on school roofs from passing cars, and then washed down by rain into the school yards.

The Morton Grove and other studies clearly demonstrate that children who breathe air with elevated lead levels will have higher lead levels in their blood. The Dept. of Health and Human Services study of lead levels of children in the U.S. also shows that because of higher metabolic rates and greater physical activity, children will inhale two to three times as much airborne lead as adults do.

A related problem is that, according to a 1974 Dartmouth Medical School study, the closer one gets to the ground the greater the concentration of lead in the air. The study found twice as much

lead in the air within four feet of the ground than above it.

What this suggests is that children playing near freeways, where there is a demonstrated higher level of lead in the air, will absorb more lead because of their size and stage of development.

**Lead in Soil May Be Bigger Problem**

But the major hazard to children in freeway parks comes not from air, but from the soil. Lead in soil near freeways has been found in a sufficient number of sites around the country that it must be assumed that it poses a danger to children who play near freeways.

Once in the soil, the chances are high that the lead will find its way into the bloodstream. A 1977 EPA review of the literature concluded that "the data from all these studies can be summarized fairly succinctly. There is evidence that children can pick up lead from their environment by getting it on their hands."

But how much of a danger? In the vernacular of health professionals, a lead-poisoned child is one who has blood lead levels grater than 80 micrograms per deciliter. A lead-burdened child is one with a lead level of over 30 micrograms. However, as more research gets done on lead, the standard for what is regarded as harmful to a child has been steadily lowered. The Center for Disease Control, the official arbiter of these matters, first defined hazardous levels of blood

# Physicians Raise New Concern Over Lead Levels in Soil

Although countless studies have measured the lead in the air (gasoline emissions dumped 90,000 tons of lead into the environment in 1980) very few public officials seem concerned with lead in the soil.

But local physicians say that some children consume soil containing lead, and for that reason the government should increase soil testing in order to decrease the risk of children contracting lead poisoning.

Sound ridiculous that a child would eat dirt? It doesn't to Dr. Daniel Hryhorczuk, assistant professor of Environmental and Occupational Health at the University of Illinois's School of Public Health.

He says that lead in the soil "poses a problem to children with 'pica', which is a medical term for the habit of putting dirt in their mouths."

Hryhorczuk does not believe a single dose of dirt will give a child a serious case of lead poisoning. But it can add to whatever lead may be in his or her system.

"There's a build-up of lead in many city children," he said. "Lead is excreted from the system very slowly, and it can build up to a toxic level."

The effects of lead poisoning vary, depending on the degree of exposure. Dr. Quentin Young, former chairman of the Department of Occupational Medicine at Cook County Hospital, said "the effects of blood poisoning from lead range from nothing, to brain damage. It depends on the amount of lead in the blood."

"You won't go to a picnic at a freeway park and get lead poisoning," he added, "but the risk of lead poisoning is significant if you are continually exposed to the air in these parks, if you or your children use the park regularly."

Children are especially sensitive to the effects of lead. *Chemical and Engineering News* reported that "studies have estimated that lead poisoning *from all sources* cost the U.S. $1 billion per year, with up to 80 percent of that cost for special education for learning impaired children." (Aug. 9, 1982)

Much of that lead came from automobile exhaust and lead-based house paint. But it is conceivable — in the eyes of Hryhorczuk and Young — that lead in the soil contributed to the problem.

The same *Chemical and Engineering News* article reported that the E.P.A. recently considered reducing the lead standards for fuel. Part of the reason the EPA decided to keep the present standard was that "the cost for treating the additional 200,000 to 500,000 children that would develop lead poisoning would range from $140 million to $1.4 billion per year."

What, then, should be done about lead in parks? Nobody suggested closing any of the 10-12 parks near freeways in Chicago, which include the lake front park and parks located beneath freeway overpasses. (This number does not include suburban parks located near freeways and other heavily trafficked roads.)

As far as Hryhorczuk is concerned, the best — albeit most difficult to achieve — solution is to "don't use lead in gasoline."

Both Young and Hryhorczuk believe more soil testing is needed before anything is done to parks.

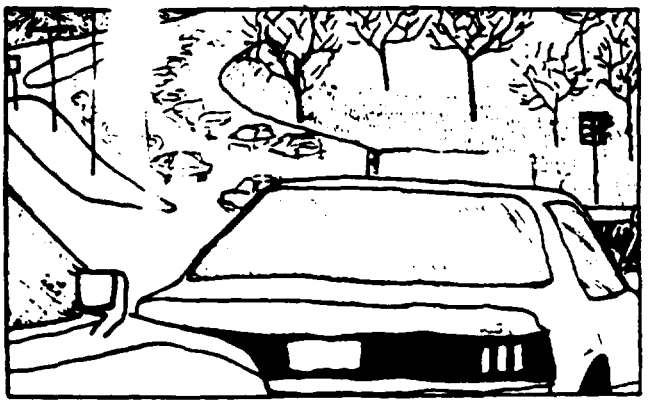
So far very little soil testing has been done by the Park District, partly b[e]cause the District doesn't feel this is a priority.

George Wo[l]f, a Park District supervisor, claimed that "very little" soil te[s]ting is done, and that the city doesn't have a policy regarc[i]ng the testing of soil before putting in a park.

The Cook [C]unty Inspectional Services Department of Environmental [C]ontrol deals with air pollution. The department's techn[i]cal services manager, Charles Legges, said he "doesn't thi[n]k there would be much of a problem with lead in the soil beca[u]se lead levels in the air are so low."

But it is li[k]ely the measurements Legges is referring to were taken at lo[w] distances from freeways. Kevin Green, a researcher for [I]EE, says that "a lot of people think the lead monitors ar[e] so far from expressways."

If Green is [r]ight, perhaps Legges ought to put measurements for lead in s[o]il on his department's agenda. — *D.McG.*



lead as 50 micrograms, that level was then lowered to 40. The "safe" level now stands at 30.

The major impetus for lowering the standard came from what is now generally regarded as the classic study in the field, even though it was completed only five years ago. Joseph Needleman and his colleagues at Harvard Medical School, rather than looking at actual physical symptoms of lead poisoning, looked at performance on intelligence tests, behavior in the classroom, and reports from teachers and parents. They found that children with blood levels of 30 micrograms and lower did worse on intelligence tests and also displayed a wide range of behavior problems sufficient to "interfere with classroom performance." Needleman concluded that the CDC standard of 30 micrograms was too high. Yet the CDC continues to hold to the 30 microgram standard.

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Other studies since Needleman's have confirmed his findings. In California, Wesolowski and his colleagues found that blood levels in children were higher near freeways, and that these children "usually did not display classical toxicity symptoms." Instead, he found that children exposed to low lead levels over a long period of time leads to a variety of clinical symptoms, including "mental deterioration, enzyme activity changes, impairment of fine motor development, concept formation and behavior."

### How Much Lead Is Too Much?

All this suggests that it is not sufficent to be only looking for "acute" symptoms of lead poisoning, but that there should be greater concern for all sources of lead absorption in the bloodstream. If the trend of research of recent years continues, it is likely that in the not too distant future it will be shown that *no* blood lead levels are safe.

The controversy surrounding the "safe" blood lead standard also raises questions about the "safe" level of lead in soil. The medical community and local governments generally consider soil with 1000 parts per million or more of lead as hazardous. Yet an EPA review of the literature concluded that levels of lead in soil far lower than the accepted standard contribute to lead in the bloodstream. EPA reviewers suggest that soil lead levels over 500 ppm should be cause for concern.

While much of lead in the air from exhaust fumes is blown away into the atmosphere, and lead in paint can be gradually eliminated as old housing stock get replaced, lead from cars accumulates for decades on soil adjacent to freeways. Nor does it get washed away after a good rainfall. The California Lead Prevention Project concluded that "once soil is contaminated from lead it may take hundreds to thousands of years for the lead to be removed by nature." For example, in the unlikely eventuality that cars were banned from the Los Angeles freeways beginning tomorrow, it would take one hundred years to erode one centimeter of soil, if the soil was flat, bare, and absorbed water quickly. For clay soil with vegetation, it would take much longer — 37,000 years in fact.

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### New Public Policy Needed

The actual levels will vary according to where the freeway is situated, wind directions, type of soil, amount of vegetation, type of surface covering, amount of traffic, and so on. But because the evidence of possible hazards is so incontrovertible, a new public policy regarding the use of public space near or under freeways is needed.

This public policy would involve the following:

- Testing of soils, sand lots, and picnic tables in parks within 100 yards of a freeway.
- Posting of signs warning parents to make sure their children don't put their hands in their mouths, and to wash their hands when they get home.
- Installing drainage systems to divert later run-off from freeways away from existing parks and playgrounds.
- In parks with high lead levels, picnic tables and sand lots should be removed, along with other contaminated soils.

The available evidence suggests that playgrounds under or near freeways are tempting but possibly hazardous solutions to the dual problems of unused space and providing needed recreation facilities. Publicly owned space near freeways should in the future only be used for parking lots, storage or warehouse space, or other uses which will keep human exposure to a minimum.

Local governments cannot control the number of cars on a freeway, nor can they control the inevitable play habits of young children. What they can control is the open space under their jurisdiction. Those spaces should not provide yet another link in the chain that has caused unacceptably high levels of lead in too many of America's children.

The landscape architect in the Chicago Parks Department, while denying that lead in freeway parks is a problem, admitted that evergreen trees do not grow very well, if at all, near freeways. "The fumes and soot from car exhausts close the pores of the leaves," he said.

Environments where trees cannot survive are not the places where children should be expected to play, grow, and hopefully flourish.